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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,640	09/29/2004	Basanth Jagannathan	FIS920040085	5639

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EXAMINER

NGUYEN, TRAM HOANG

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

5/

<b>Office Action Summary</b>	<b>Application No.</b> 10/711,640	<b>Applicant(s)</b> JAGANNATHAN ET AL.	
	<b>Examiner</b> Tram H. Nguyen	<b>Art Unit</b> 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-20 and 31-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-20 and 31-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. In response to the communications dated 07/03/2006, claims 14-20 are active in this application.

New claims 31-43 have been added.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 14-17, 20, 33-36 and 39 are rejected under 35 U. S. C. § 102 (e) as being anticipated by Herzum et al. (U.S. Pub No. 2004/0238871) (hereinafter Herzum).

Regarding to **claim 14**, Herzum discloses a semiconductor device (fig. 1A) comprising: a substrate (reference numeral 10); a source (reference numeral 14) and a drain (reference numeral 16) arranged within the substrate (reference numeral 10); gate (reference numeral 20) formed on the substrate (10) between the source and drain (14/16 respectively); and substrate contact (reference numeral 12) formed within the substrate in electrical contract with the source (fig. 1A), wherein little or no current flows though the substrate contact (Note: par. [0036] explains there is current flow through the

substrate which supports the limitation “little current flows through the substrate contact”).

Regarding **claim 15**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above. The recitation “ the substrate contact being configured to shield the semiconductor device from electrical noise”, refers to an operational limitation and any such limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Regarding **claim 16**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above; furthermore fig. 1A shows the substrate contact being in direct physical contact with the source of the semiconductor device.

Regarding **claim 17**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above. In addition, Herzum also teaches the substrate contact comprises a p+ region (par. [0035], line 3).

Regarding **claim 20**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above; moreover, fig. 3 of Herzum shows the substrate contact (reference numeral 12) comprises a p-type doped silicon tab contacting source (reference numeral 14) and a silicide layer (reference numeral 52) on a top of the substrate contact (reference numeral 12).

Regarding **claim 33**, Herzum discloses a semiconductor device (fig. 1A) comprising: a substrate (reference numeral 10); a source (reference numeral 14) and a drain (reference numeral 16) arranged within the substrate (reference numeral 10); a gate formed on the substrate between the source and the drain; and a ring substrate contact (reference numeral 12) formed within the substrate in electrical contact with the source (fig. 1A).

Regarding **claim 34**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above. The recitation “the ring substrate contact being configured to shield the semiconductor device from electrical noise”, refers to an operational limitation and any such limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Regarding **claim 35**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above; furthermore fig. 1A shows the ring substrate contact (12) being in direct physical contact with the source of the semiconductor device.

Regarding **claim 36**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Herzum exhibits the ring substrate contact (12) comprises a p<sup>+</sup> region (fig. 1A).

Regarding **claim 39**, Herzum discloses all the limitations of the claimed invention for the same reasons are set-forth above; moreover, fig. 3 of Herzum shows the ring substrate contact (reference numeral 12) comprises a p-type doped silicon tab contacting source (reference numeral 14) and a silicide layer (reference numeral 52) on a top of the substrate contact (reference numeral 12).

### ***Claim Rejections - 35 U.S.C. § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

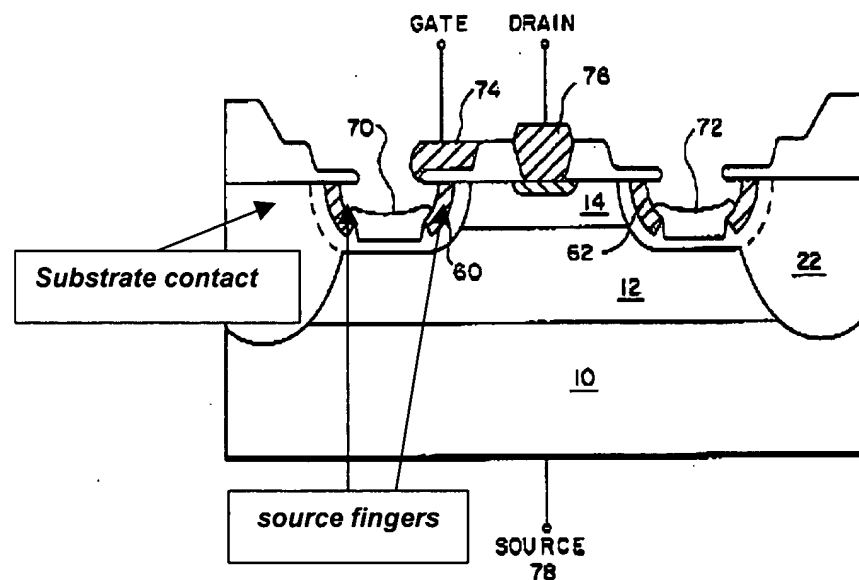
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 18-19, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzum as applied to claim 14 above, and further in view of Rice (U.S. Patent No. 4,738,936; hereinafter Rice).

Regarding **claim 18**, Herzum discloses all the limitation of the claimed invention for the same reasons are set-forth above except for not explicitly teach the source comprises a source finger and the substrate contact abuts substantially all of one side of the source finger. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein the source comprises a source finger and the substrate contact (reference numeral 20) abuts all of one side of the source finger (reference numeral 60) (col. 4, line 19).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).



**FIG. 1H**

Regarding **claim 19**, Herzum and Rice disclose all the limitations of the claimed invention for the same reasons are set-forth above; likewise, Rice also teaches two source fingers arranged within substrate, wherein the substrate contact abuts two of the two source fingers (refer the above fig. 1H).

Regarding **claim 31**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above except for not explicitly show the substrate contact at least one of completely encircles an active region; almost completely encircles an active region; encircles three-quarters of an active region; and encircles half of an active region. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein the substrate contact (reference numeral 20/22) at least completely encircles an active region (col. 2, lines 46-49). Therefore, it would have been obvious at the time the



invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

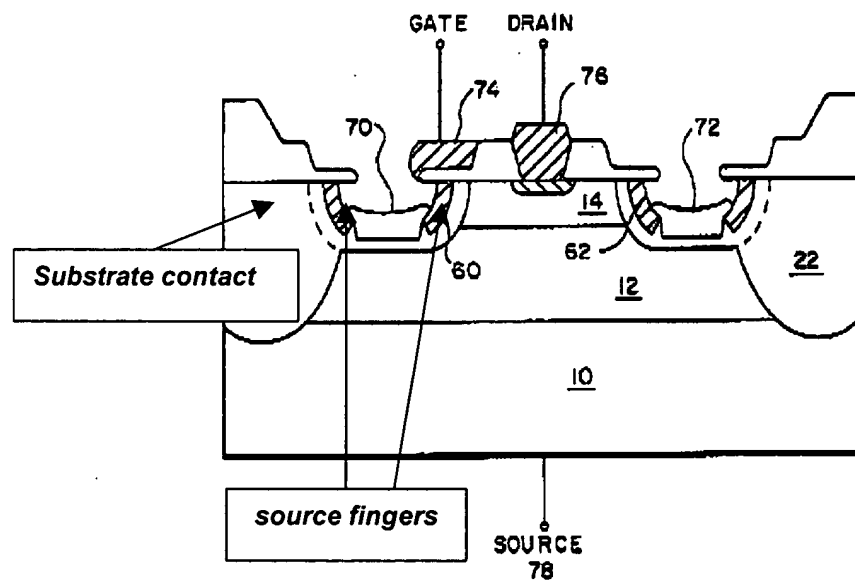
Regarding **claim 32**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above except for the semiconductor device comprises an FET prime cell. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein comprises an FET prime cell (Title). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

7. Claims 37-39 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzum as applied to claim 33 above, and further in view of Rice

Regarding **claim 37**, Herzum discloses all the limitation of the claimed invention for the same reasons are set-forth above except for not explicitly teach the source comprises a source finger and the substrate contact abuts substantially all of one side of the source finger. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the ring substrate contact (described in col. 4, lines 36-38)) wherein the source comprises a source finger and the ring substrate contact (reference numeral 20)

abuts all of one side of the source finger (reference numeral 60) (col. 4, line 19).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).



**FIG. 1H**

Regarding **claim 38**, Herzum and Rice disclose all the limitations of the claimed invention for the same reasons are set-forth above; likewise, Rice also teaches two source fingers arranged within substrate, wherein the substrate contact abuts two of the two source fingers (refer the above fig. 1H).

Regarding **claim 40**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above except for the semiconductor device comprises an FET prime cell. However, Rice has a similar structure (fig. 1H) (Note: the current

flows through the substrate contact (described in col. 4, lines 36-38)) wherein comprises an FET prime cell (Title). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

Regarding **claim 41**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above except for not explicitly show the substrate contact at least one of completely encircles an active region; almost completely encircles an active region; encircles three-quarters of an active region; and encircles half of an active region. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein the substrate contact (reference numeral 20/22) at least completely encircles an active region (col. 2, lines 46-49). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

8. Claims 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzum, and further in view of Rice.

Regarding **claim 42**, Herzum discloses a semiconductor device (fig. 1A) comprising: a substrate (reference numeral 10); a source (reference numeral 14) and a drain (reference numeral 16) arranged within the substrate (reference numeral 10); a gate formed on the substrate between the source and the drain; and a ring substrate contact (reference numeral 12) formed within the substrate in electrical contact with the source (fig. 1A).

Herzum fails to teach show the substrate contact at least one of completely encircles an active region; almost completely encircles an active region; encircles three-quarters of an active region; and encircles half of an active region. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein the substrate contact (reference numeral 20/22) at least completely encircles an active region (col. 2, lines 46-49). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

Regarding **claim 43**, Herzum discloses all the limitations of the claimed invention for the same reasons as set-forth above except for the semiconductor device comprises an FET prime cell. However, Rice has a similar structure (fig. 1H) (Note: the current flows through the substrate contact (described in col. 4, lines 36-38)) wherein comprises an FET prime cell (Title). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a source direct

source to substrate contact in order to reduce expensive packaging techniques, further reduce output capacitance, and to reduce or eliminate junction capacitance (col.1, lines 56-59).

### ***Response to Arguments***

9. Applicant's arguments with respect to claims 14-20 have been considered but not persuasive. The traversal is on the ground(s) that "HERZUM discloses that the substrate contact 12 is in electrical contact with the source 14 (see paragraph [0036]), HERZUM also explains on paragraph [0036] that the current flows from the source to the contact 12. Thus, it is not apparent that HERZUM can be read to disclose or suggest that little or no current flows through the substrate contact." However, Examiner disagrees as Applicant acknowledges that there is current flow through from the source to the contact 12 (see Herzum: par. [0036]) which can be read on the limitation "little current flows through the substrate contact." Furthermore, Applicant fails to determine how much little current flows through the substrate contact.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tram H. Nguyen whose telephone number is (571)272-5526. The examiner can normally be reached on Monday-Friday, 8:30 AM – 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax numbers for all communication(s) is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

THN  
Art Unit 2818  
09/06/2006

*Andy Nguyen*  
Primary Examiner